



2. EXISTING CONDITIONS

This chapter reviews the history of the project area, adjacent land uses, property ownership, current and proposed rail operations, and existing safety conditions.

History

The Grand Junction Railroad was one of the first north-south rail links in the Boston metropolitan area. Opened in 1855 by the Grand Junction & Depot Company, the line followed a serpentine alignment weaving through the newly industrialized areas of Cambridgeport, East Cambridge, Charlestown, Everett and Chelsea, ending at the piers of East Boston.

In the latter half of the 19th century, Cambridge had an extensive network of spurs, sidings and street trackage serving warehouses and factories. The main line included as many as four or five tracks in places, while the spurs and street trackage branched out to locations several blocks from the main line. Several firms provided a significant source of freight revenue, including: Boston Woven Hose and Rubber Co. (rubber goods, hose, tires, and belts; at the current “One Kendall Square”); North Packing & Provision Co. (meats); John Reardon & Sons (soap); and Norcross Bros. (stone cutters).



MIT in 1901

The Grand Junction RR initially also provided freight connections between the south side Boston & Worcester RR and the four north side lines that were eventually merged into the Boston & Maine RR. The Boston & Worcester RR became the Boston & Albany RR (B&A), and the Grand Junction RR itself was bought by the B&A in 1869. By 1900, the B&A was purchased and operated by its new parent company, the New York Central System.



One Kendall Square

The shifting of the New England economy from a manufacturing base to a high tech and service base in

the latter half of the 20th century reduced the importance of the line for local freight service. For example, between Main Street and Binney Street, manufacturing facilities have been replaced by office and research/development facilities such as Technology Square, One Kendall Square, and Cambridge Center. MIT has purchased and redeveloped or demolished many of the industrial buildings between Memorial Drive and Main Street. Today there are no freight rail customers along the Grand Junction in Cambridge.

After the Massachusetts Bay Transportation Authority (MBTA) took over the Boston area commuter rail from the Boston & Maine and Penn Central Railroads, the Grand Junction railroad gained new importance. Beginning in 1977, a single commuter rail operator was contracted by the MBTA (initially the Boston & Maine RR was the contractor until 1987, when Amtrak won the contract, through 2003, when the Massachusetts Bay Commuter Railroad became the contractor). One result of this switch to a single regional operation was that equipment now needed to be moved regularly between north and south side operations. In 2001, Amtrak started its Downeaster service between North Station and Portland, ME, creating its own need to move passenger equipment between North Station and its maintenance facility at Southampton Street.

Corporate consolidations in the railroad industry have seen the Grand Junction railroad change owners from the New York Central to Penn Central to Conrail and now CSX Transportation. Currently, the Grand Junction line remains the only north-south rail connection east of Framingham and Worcester. A typical weekday sees four to six freight trains through the corridor, with occasional trains during weekends.

Project Setting

The Grand Junction corridor is located in the eastern portion of Cambridge. This is an urban area that is densely populated. The southern end of the corridor passes through the campus of the Massachusetts Institute of Technology (MIT), and borders on the Cambridgeport neighborhood. The middle section passes through the Kendall Square/Cambridge Center area, and borders on the Area Four neighborhood. The northern end passes through the East Cambridge neighborhood and business district.

The corridor runs northeasterly from the Charles River to just north of Main Street. From this point, the corridor runs to the north to the City Line at Gore Street. *For the simplicity of description, this report will describe the Grand Junction corridor as running north-south.*

Property boundary data and property tax record data are summarized on a series of seven drawings entitled “land ownership and easements” (see Appendix B). The preliminary alternatives analysis in Chapter 3 includes an evaluation of ownership and property impacts of the major alternatives for the proposed RWT.

Population and Employment

Population and employment data (see Table 2-1) was taken from the census tracts that lie within one-half mile of the Grand Junction corridor. The population – over 34,000 persons or approximately 34% of the city’s population – includes residents in Cambridgeport, Area Four, and East Cambridge. Employment includes the Kendall Square/Cambridge Center area, MIT, and nearby employment centers such as University Park, portions of Central Square, business districts along Main and

Cambridge Streets, and various office, research & development, and industrial land uses along and near the tracks.

Table 2-1. Population and Employment

Population within 1/2 mile of corridor:	34,231
Employment within 1/2 mile of corridor:	56,017*

Source: Cambridge Community Development Dept., November 2003.

*This employment data is from 1999. Newer data is unavailable at this time; however, the figure is certainly higher given the expansion of office and R&D facilities.

Adjacent Land Uses and Zoning

The Grand Junction corridor passes through multiple land uses. Not surprisingly, that corridor until quite recently was heavily industrial in nature, reflecting a past land use pattern that was dependent on the railroad for transportation services. The corridor has been zoned for high-density commercial and industrial development since the inception of zoning in Cambridge in 1924. Beginning in the 1960s and accelerating since about 1980, land uses along the corridor have begun to change dramatically, reflecting contemporary economic influences and the changing nature of urban living.

Expansion of the adjacent MIT campus has begun to transform significant stretches of the corridor; academic, research, and residential uses are replacing old industrial or long vacant land along the corridor along Vassar and Albany Streets up to Main Street. Below Massachusetts Avenue, institutional housing is expected to become a predominant use along the corridor.

North of Main Street, redevelopment through private and public initiatives has transformed abutting areas to contemporary research, development office parks, and some housing.

North of Binney Street, formerly commercial and industrial parcels have been giving way to low to moderate density housing development in the spirit of the development typical on abutting neighborhood streets.

The entire corridor has been rezoned within the past twenty years to reflect contemporary views of how land adjacent to it should be developed (see Figures 2-1 and 2-2). Fourteen zoning districts of quite varied character have replaced the permissive high density, heavy industrial Industry B zoning district that prevailed along almost the entire corridor in the 1960s. In general, the trend has been to lower the densities permitted, restrict the kinds of heavy industrial uses previously allowed, and introduce housing as a permitted use everywhere. Between Massachusetts Avenue and Binney Street the highest densities are allowed at the center of the new office/research and development district at Kendall Square. North of Binney Street lower densities are imposed where housing at neighborhood densities have been building in the past and are encouraged in the future. South of Massachusetts Avenue high density institutional districts apply where the MIT campus is anticipated to expand. In lower Cambridgeport mixed use districts at moderate density prevail. The following are the current districts along the corridor (from south to north):

Special District 5: A medium density office district with a maximum height of 85 feet. Setbacks are required.

Special District 10:	A low-density residential district with a maximum height of 35 feet. Setbacks are required
Residence C-2A District:	A high-density residential district with a maximum height of 60 feet. Setbacks are required.
Special District 11:	A medium density office district with a maximum height of 85 feet. Setbacks are required.
Special District 8A:	A medium density residential district with a maximum height of 60 feet. Setbacks are required.
Special District 8:	A medium density light industrial district with a maximum height of 60 feet. Setbacks required only for residential uses.
Special District 6:	A high-density institutional residential district with a maximum height of 180 feet. No setbacks are required.
Residence C-3B District:	A high-density institutional residential district with a maximum height of 120 feet. No setbacks are required.
Industry B district:	A high-density heavy industrial district with a maximum height of 120 feet. No setbacks are required. This used to be the zoning designation along the entire length of the corridor.
MXD District:	Mixed-use district guiding growth in the Cambridge Redevelopment Authority Kendall Square Urban Renewal Plan area. There is a maximum height of 250 feet. No setbacks are required.
Industry A-1 District:	A medium density light industrial district with a maximum height of 45 feet; bonuses in density and height are given for housing development. Setbacks are only required for housing uses.
Residence C-1 District:	A lower density multifamily residential district with a maximum height of 35 feet. Setbacks are required. This is the typical Eastern Cambridge zoning district in residential neighborhoods.
Business A District:	A medium density neighborhood retail district with a maximum height of 45 feet. Setbacks are required only for residential uses.
Residence C-3 District:	A height density residential district with a maximum height of 120 feet. Setbacks are required.

The setback requirements of the districts are noted particularly because where they are not required, new construction can occur right up to the lot line along the corridor. The center of the corridor frequently serves as the location of the boundary line between two zoning districts. In general, with the exception of the low density Residence C-1 district, development of 50,000 square feet of development would require a special permit from the Planning Board before the development could proceed, under the provisions of the Article 19.000 Project Review Special Permit procedures. The Planning Board would be free to review the impact of the proposed development on the Grand

Junction corridor during that process. Development of less than 50,000 square feet might be able to proceed without any discretionary planning permit from the City.

Where portions of the corridor are sold off to private parties abutting it, that land may be developed in any way permitted by the applicable zoning district.

In order to prevent the erosion of the potential of the corridor to serve as a multipurpose transportation route through the sale of land to abutters, consideration might be given to a set of special zoning regulations, put in place through the mechanism of a “pathway overlay district,” such as was adopted in the Alewife area in 2006. Land could still be sold to private parties, but development would be prohibited within the corridor. Any development potential (in terms of floor area or parking spaces, for instance) would have to be used on portions of lots outside the corridor; the land within the corridor, however, could be used to meet setback or open space requirements.

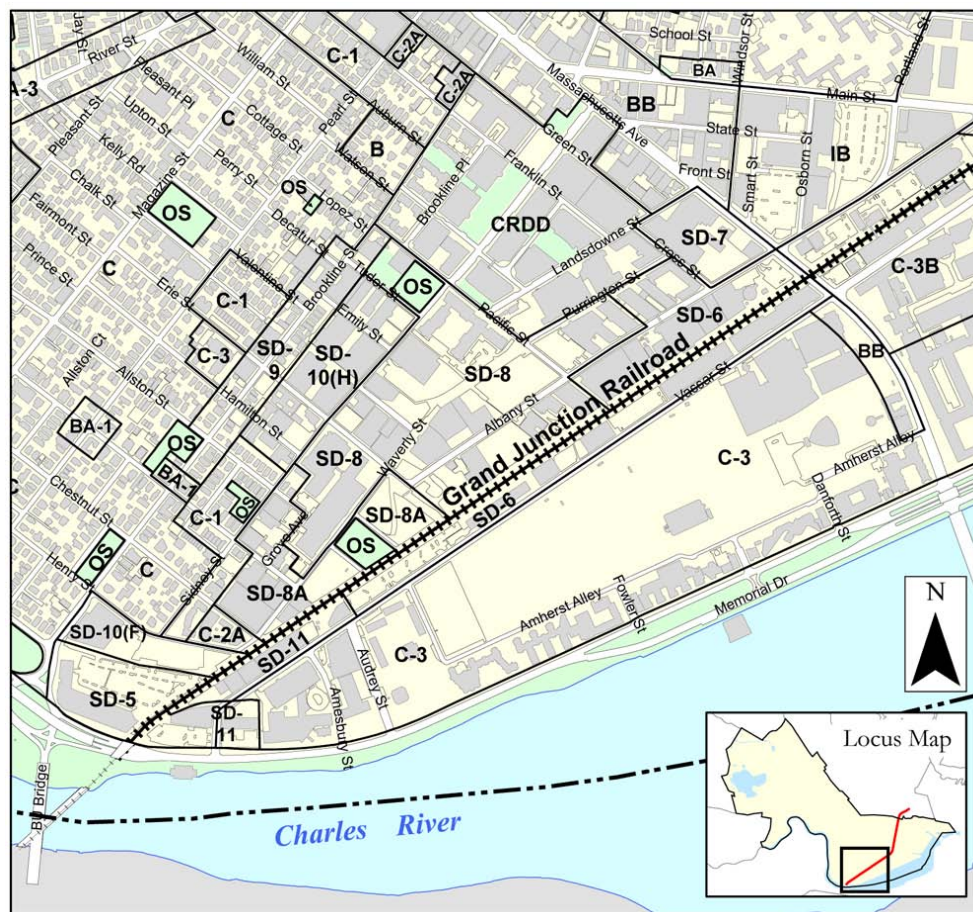


Figure 2-1 Zoning Districts along the Grand Junction Corridor (Southern End)

Table 2-2. Summary of Trail Segments

From Location	To Location	Current Owner of Land Where Trail would be Located	Distance (feet)
750 ft west of Memorial Drive 00+00	250 ft west of Pacific Street Ext 30+55	CSX(a)	3055
250 ft west of Pacific Street Ext 30+55	Massachusetts Avenue 45+60	MIT	1505
Mass Ave* 45+60	Mass Ave 46+25	Cambridge	65
Massachusetts Avenue 46+25	Main Street 60+50	MIT	1425
Main Street* 60+50	Main Street 62+85	Cambridge	235 (b)
Main Street 62+85	Broadway 70+25	CRA	760
Broadway* 70+25	Broadway 71+10	Cambridge	85
Broadway 71+10	Binney Street 78+40	CRA	730
Binney Street* 78+40	Binney Street 79+35	Cambridge	95 (c)
Binney Street 79+35	Cambridge Street 97+45	Private	1810
Cambridge Street* 97+45	Cambridge Street 98+50	Cambridge	105 (d)
Cambridge Street 98+50	Gore Street 103+60	CSX	510
		TOTAL	10,360

* Refers to where the path crosses the street or along the sidewalk

(a) A portion of the former rail ROW just east of Memorial Drive is owned by MIT

(b) Includes 185 ft. long trail segment on west side of Main Street and rail crossing

(c) Includes 60 ft. long trail segment on east side of Binney Street and rail crossing

(d) Includes 55 ft. long trail segment along Cambridge Street and rail crossing

The Massachusetts Institute of Technology (MIT) purchased a significant length of the railroad corridor and former ROW. MIT's ownership of the corridor begins about 240 feet west of Pacific

Street Extension and runs east and north to Broadway. In this area, CSX holds an easement 32 feet wide west of Massachusetts Avenue and 16 feet wide east of Massachusetts Avenue. The wider easement encompasses the main track and a siding on the southeast side of the corridor. An initial property ownership search was performed in 2000 using the City of Cambridge Assessor's maps and database available at the city website. The results of the property ownership search are tabulated in Appendix B.⁶

⁶ There may be changes in ownership that have occurred since this research was performed in 2000.

Current and Proposed Rail Operations

Track Layout

The Grand Junction railroad is a signal-less single track line with one active siding (the “long” siding.) (see Figure 2-3 below). It includes eight grade crossings and four grade-separated structures, as indicated in Table 2-3 and Table 2-4.

The Necco Spur is no longer in use and the City is moving forward with plans to convert the line into a bicycle and pedestrian multi-use path.

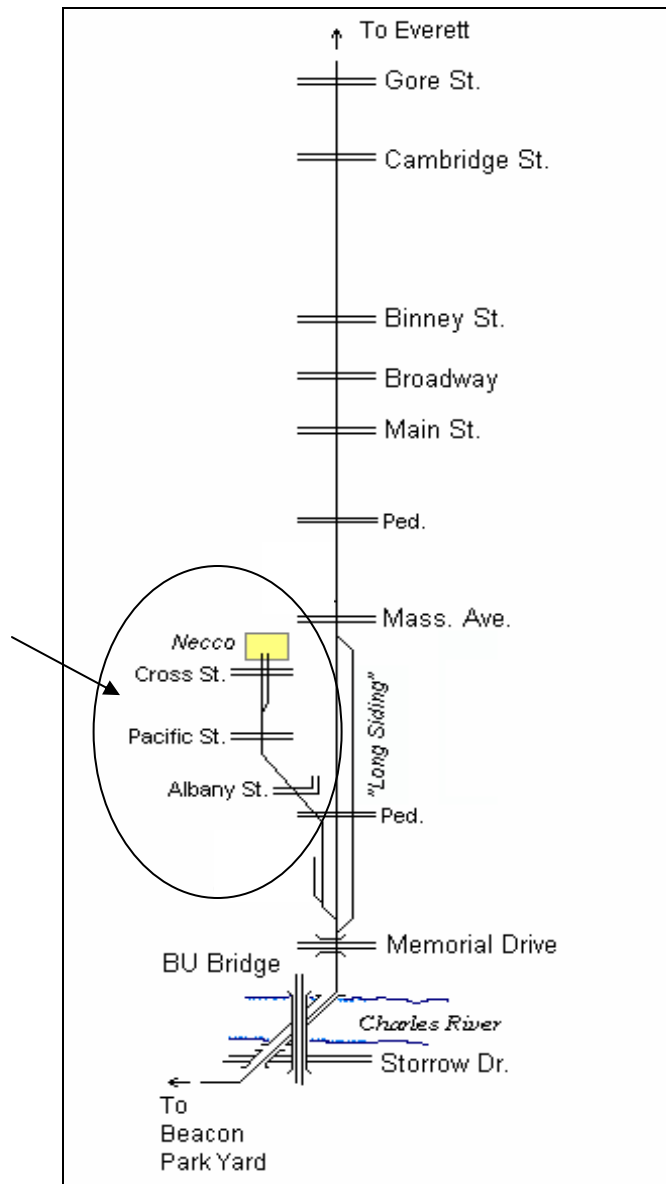


Figure 2-3. Map of Grand Junction Track in Cambridge

Table 2-3. Grade Crossings

Location	Type	Width of Crossing	Type of Crossing Protection	Comments
Ft. Washington	Pedestrian	--	Flashing Signal & Gates	Crossing protects main track and long siding. (Unused Necco spur is not protected)
Mass. Ave.	Road	4 lanes + 2 sidewalks	Flashing Signals, only	--
Ped. Crossing	Pedestrian	--	Flashing Signal & Gates	--
Main St.	Road	2 lanes + 2 sidewalks	Flashing Signals only	--
Broadway	Road	4 lanes + 2 sidewalks	Flashing Signals only	--
Binney St.	Road	2 lanes + 2 sidewalks	Flashing Signals only	--
Cambridge St.	Road	2 lanes + 2 sidewalks	Flashing Signal & Gates	--
Gore St.	Road	2 lanes + 2 sidewalks	Flashing Signal & Gates	--

Table 2-4. Grade-Separated Crossings

Location	Type	Width of Crossing	Type of Structure	Comments
RR over Charles River	Railroad Bridge	--	Triple through plate	One bay used for active track; other bay is not used.
Memorial Drive over RR	Roadway Bridge	4 lanes + 2 sidewalks	Simple span, steel girders, concrete deck	--
Pedestrian Bridge over RR	Pedestrian Bridge	Single walkway		Connects MIT garage and MIT land next to Albany St.
Utility Bridge over RR	Enclosed Utility Bridge	--	Assumed steel framed with cladding.	Connects MIT co-generation plant to chilled water facility.

Current Rail Operations

Three rail operators currently run trains over the Grand Junction line. CSX operates freight trains as a transfer run between its Beacon Park yard in Allston and its yard at the produce market in Everett. The Massachusetts Bay Commuter Railroad operates the MBTA commuter rail system; with passenger equipment transfer runs between its north side and south side operations. Amtrak uses the Grand Junction for equipment moves to support the Downeaster operation from North Station to Portland, ME.

A typical day may see four to six trains on the Grand Junction line through Cambridge. Train operations include CSX transfer runs, CSX car storage movements, MBTA equipment transfers, Amtrak equipment transfers, and special movements (e.g. Barnum & Bailey circus trains).

The car storage movement involves the movement of intermodal flat cars from Beacon Park yard to the long siding track between Massachusetts Avenue and Memorial Drive. Switches at each end of the side track allow the cars to be pulled into place, the power to be cut off, and the cars to return to Beacon Park on the main track. To allow passage at the pedestrian crosswalk at Ft. Washington, the line of stored cars is cut in two after it is shoved or pulled into place. This movement occurs from time to time when Beacon Park is crowded and additional temporary storage is needed.

The passenger equipment transfer occurs when MBTA passenger equipment (locomotives and cars) needs to be transferred between the north side and south side operations. The movements may include a single engine moving “light” or may include locomotives and cars pulled by an MBTA or CSX yard engine.



Pedestrian bridge at MIT



CSX yard engine

Table 2-5. Sidings and Spur Tracks in Cambridge

Track	Location	Description	Usage	Comments
CSX Long Siding	Memorial Drive to Mass. Ave.	Long side track	In use	Used to store overflow cars from Beacon Park yard; Also used for through traffic when circus train is parked on the main track.
Short siding	169 Waverly Street	Short siding	Not in use	
Former Necco/Stimpson spur track	Anglim Street to Cross Street	Long spur (3800'). Switch is just north of Memorial Drive.	Not used	Spur is parallel to main track until Ft. Washington Park. After the NECCO company left, there were no more uses for the spur. The City owns the portion from Ft. Washington Park to Purrington Street and is beginning the process of designing and creating a bicycle/pedestrian multi-use path along the spur
"MIT" siding	89 Albany St.	Short siding, just north of Mass. Ave.	N/A	The MIT siding was removed in 2003

Track speed is limited to 10 mph. All grade crossings are protected by flashing lights. (See Table 2-3) The crossings at Cambridge Street, Gore Street, and the two pedestrian crossings include gate arms. To activate the grade crossing signals, the train must stop as it approaches the crossing. Trains also use their horns to signal a warning when approaching a crossing.

Proposed Rail Operations

- Freight: Freight operations are expected to continue in the same manner as existing operations.
- MBTA: MBTA equipment transfer runs are also expected to continue.
- Possible North Station – South Station Rail Link: If the proposed rail link (tunnel), a project on indefinite hold, is constructed between North and South Stations, both the MBTA and Amtrak equipment moves along the Grand Junction would likely be switched to the new connection. However, freight operations would still use the Grand Junction line, as the link is intended only for passenger train operations.
- Possible Relocation of CSX Beacon Park Freight Yard: The CSX freight yard in Allston is on land owned by Harvard University. For the purposes of revenue for development, the Turnpike Authority may decide to develop the land for other purposes, which may lead to the need to relocate the freight yard. Depending on the location of the relocated freight yard, the Grand Junction line may or may not remain as the north-south freight link.
- Possible MBTA Urban Ring:

At-Grade Alternatives: This option applies to Phase II and III of the Urban Ring. In Phase II, the bus rapid transit at-grade alternative would be a one-way at-grade busway entering the right-of-way in lower Cambridgeport and continuing to Main Street. In Phase III, the light rail at-grade alternative would emerge from a subway tunnel in the vicinity of Ft. Washington Park. With either mode, stops would be at Cambridgeport (near the park) and Massachusetts Avenue. At Main Street, either alternative would leave the right-of-way and pass through Kendall Square and turn up Third Street. The light rail alternative provides

for retaining the existing track (freight and passenger) next to the two light rail tracks. Where existing sidings are still in use, these tracks are also assumed to remain in addition to the two light rail tracks.

Below Grade (Subway) Alternative. This option would include a bored tunnel under the right-of-way. This option would potentially leave the surface conditions along the right-of-way essentially unchanged, except at the locations of stations and ventilation shafts. Bored tunneling would minimize the need to disturb the surface of the corridor while constructing the tunnel.

Existing Safety Conditions

Pedestrian Access to Right-of-Way

Though most of the right-of-way is fenced, there are frequent opportunities for pedestrians to gain access. These include all eight grade crossings and other openings in the fence, such as at Pacific Street and the unfenced section along Waverly Street. It is very easy for pedestrians to trespass within the right-of-way. With only a few trains per day and the low operating speed, there is little to discourage this behavior.

Train Operations

Existing rail operations are at very low speeds. Typically, trains travel at about 10 mph. At most of the signaled grade crossings, the train must stop in order to activate the signals. The low speed and frequent stops represent a low potential for train/vehicle and train/pedestrian conflicts.

